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Partnership approaches in flood risk management: lessons from the Eastern Alps

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Abstract. In the past decades flood risk management has taken a paradigm shift away from a structural, security-based approach towards more an integrated, risk-based approach. While the 'traditional' approach was informed by a firm belief in controlling rivers via engineering solutions, flood risk management today increasingly acknowledges the importance of providing 'more space for the rivers'. The new policy agenda has been implemented to enhance the development of catchment-wide management plans in flood risk management and at the same time to reduce the controlling role of central national governments. The aim of the paper is to examine the new role of these local authorities and organisations in flood risk management as well as how the nature of partnerships are established and operate, focusing especially on the main barriers and challenges. The current goal of this partnership approach lies with the conservation of regionally important retention areas for protective measures on an inter-local level. An important issue is that of compensation measures between upstream and downstream communities, which at present is causing many conflicts. We conclude that although a catchment-wide management approach may be seen as an 'optimal' solution for flood risk management. However, in practice there are many limitations and barriers in establishing these collaborations and making them effective.

1 Introduction

Partnership development in flood risk management includes a shift in the flood risk management policy. Therefore, a clear statement is the implementation of catchment-wide management plan [1]. This includes a broader co-operation between local authorities, especially in rural areas. The key aim is consensus building between the different groups [2, 3]. Key aspects are 'inclusion, power-sharing and joint decision-making' as well as 'an interaction of equals, rather than a subject-object relationship' [2: p. 492].

Partnership arrangements are mainly based on interaction between the different actors and stakeholders. The interaction is strongly influenced and defined by the institutional framework and the relationships of exchange between the different actors and stakeholders under competitive or co-operative environments [4]. The interaction within co-operations are influenced by the distance or proximity (socially or geographically) between the different involved actors [5]. The concept of proximity is well known in the regional innovation literature [5, 6, 7, 8, 9]. In this literature, the term proximity is understood as the 'beneficial for the transfer of knowledge' [8: p. 117). In particular, proximity allows this thesis to analyse the interaction between the different actors and stakeholders involved in partnership arrangements. The key interpretation is the rediscovery of the concept of space and place in the academic and policy discussion [10]. Torre and Rallet [10] defined proximity as not only meaning "being near him/her, but also means having a strong complicity within a person who is geographically distant, whatever that person belongs to the same circle of friends, family, or even to the same network' [10: p. 48]. According to the authors, the inter-regional relationships have a less important role compared to the intra-regional contacts and networks. Geographical proximity is the physical distance between the members of the co-operation, such as (1) naturally distance (in terms of km) and (2) based on individual judgement (in terms of individual perception and background). On the other hand, organisational proximity is defined as the interaction and co-operation between the different members in the co-operation [4, 10]. This includes aspects of personal interactions and similarities between the different members, like sharing experiences, language, knowledge and representatives. However, Moodysson and Jonsson [8] defined these arguments as 'vague and loosely defined' [8: p. 118]. Therefore, the aims of this paper are:

1. What are the influencing factors for partnership arrangements in flood risk management and to what degree does proximity and distance

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influence the engagement between the different actors?

2. What are the ideal stages in partnership arrangements in flood risk management and which implications arises for policy makers?

2 Literature review

This paper focuses on following categories: spatial, institutional, social, technology and relational proximity. Spatial proximity raises the aspect of physical distances between the different actors [4, 5, 6, 8]. This refers mainly to the aspect of transactions costs (e.g. transport costs), possibility to arrange meetings as well as possibility to monitor the efficient use of resources. Therefore, the geographical units play a crucial role in the aspect of informal meetings. Throughout informal meetings this has an important role in the inter-local co-operation. Balland [11] described the physical distance as the 'simplest' form of analysing the spatial proximity. Furthermore, spatial proximity also refers to the political boundaries between the different actors, e.g. district or regional boundaries. Second, institutional proximity refers to the aspect of regulative, normative, and cognitive aspects [6, 8]. The institutions determine the 'rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction' [12: p. 3], consisting norms and rules (formal legal and informal social). These rules govern individual behaviour as well as structure social interactions. Furthermore, he suggested that 'institution include any form of constraint that human beings devise to shape human interaction' [12: p. 4]. Institutions have a direct influence on individuals, but also vice versa. Social proximity refers to the social relationship between the different actors within the co-operation [9], where trust plays a strong factor [11]. Technology proximity expresses the shared understanding of technological experiences, knowledge and expertise. Technology is a key aspect and challenge in the in the flood risk management. The implementation of new technologies needs adequate structures, human resources and knowledge. In the past years, the aspect of technology in flood risk and environment management has become a more important aspect. The key driver was the increasing frequency of flood events and the needs of a more frequent evaluation and strategic flood planning, which includes an adaptation of new technologies and knowledge [13]. The key arguments are that traditional-structural measures (e.g. dykes and dams) cannot solve flood risks. Traditional flood protections are now viewed more critically, especially from society due to a possible negative impact to environment or failures, like a dam break. A key aspect is the different use of return period in the definition of flood defences or hazard maps. These cause interdependences between both organisations. In addition, the shift in the economic policy (e.g. fiscal squeeze) needs new technologies to reduce the costs. Nevertheless, the successful implementation of new technologies needs willingness and openness of public administrations and stakeholders. An important aspect is the coordination and combination of structural measures, preventive measures and operative measures during flood events started for flood prevention, protection and mitigation, e.g. an appropriate land use, early-warning-systems, a better communication between several public institutions and the population. However, this new approach needs an integrated and comprehensive action plan [14]. 'Nevertheless, many governments lack an adequate institutional system for applying cost effective and reliable technologies for disaster prevention, early warnings, and mitigation' [13: p. 465]. There is still open the questions, if the public administration and population is open and ready for new technologies. In addition, key problem of the use of non-structural measures are their non-visibility to the society. Finally, relational proximity is based on the concept of social capital and common language [6, 15, 16]. Zeller [6] understands relational proximity as 'informal structures that reinforce or counteract the effects of the formal organisations' [6: p. 88].

3 Conceptual framework

Stage 1 (inadequately integration): key problems are physical distance between the different actors (functional proximity), low degree of trust between the actors (social proximity) or lack of benefits from the co-operation. A key barrier is the local trap of the communities, the fear to lose competences, power and limitations of self-governing. Additionally, often there is no clear definition of sharing responsibility between the different actors as well as unequal – asymmetric power sharing (Razafindrabe et al. 2012). In addition, a key barrier is the uncertainty regarding future developments.

The results are strongly conflicts between the different actors. This includes a relative low willingness for co-operating [5]. The integration process is mainly based on developing and funding structural flood defence measures. The conceptual framework shows that there is low integration in the harmonisation of non-structural measures, especially regarding emergency managements and spatial planning. In general, harmonisation and use of non-structural flood defence measures are secondary goals. However, the different actors recognise the individual benefits of the inter-local co-operation.

Stage 2 (semi-integration): goes a step further. In contrast to stage 1, the level of engagement includes also non-structural measures in the policy discussion. The harmonisation of non-structural measures between the different communities is not fully integrated, specifically spatial and land use management or emergency management plans. In this stage of co-operation local authorities still define individual objectives, also based on given political – institutional barriers.

Stage 3 (full integration): includes the full integration between the different communities. We assume this as

the final step in the inter-local co-operation process. The focus is on the implementation and maintenance of structural measures as well as full harmonisation of non-structural instruments, e.g. spatial governance approach and catchment-based emergency management plan. The introduction of spatial governance framework, the communities exchange information (e.g. round tables, meetings) about their developments in relation to local-land use in the next years. The key objective is the use of a mix of different management instruments to reduce the impact of future flood events. An important issue is to avoid contradictory policy directions in the inter-local co-operation. Throughout, an important consideration is the social learning process between the different actors.

This framework represents an ideal type to reduce the complexity. In practice we cannot find these, clear distinctions between the different stages. In fact, there are more mixes between the different models between the different instruments.

4 Method and case study description

The research method applied in this paper is centrally focussed on a qualitative research design. The structure is using a heuristic – circular perspective with a focus on multi-methodology, based on primary and secondary data collection, multiple case studies as well as multi-analytical methods [17, 18]. The aim of semi structured in-depth interviews is to understand better the current policy documents, especially background information and how they are adopted on the ground both of these factors are not available from the secondary data source. In research studies, there exist a lack of sufficient information and data from the secondary data sources, so qualitative methodology is a useful instrument to collect new data [19]. The semi-structure interviews were conducted between February and May 2012; in total 29 stakeholders were interviewed. We selected three different study sides (figure 1) in three different Federal States to analyse the differences and commonalities to achieve a broader overview of the development of partnership approaches in flood risk management.

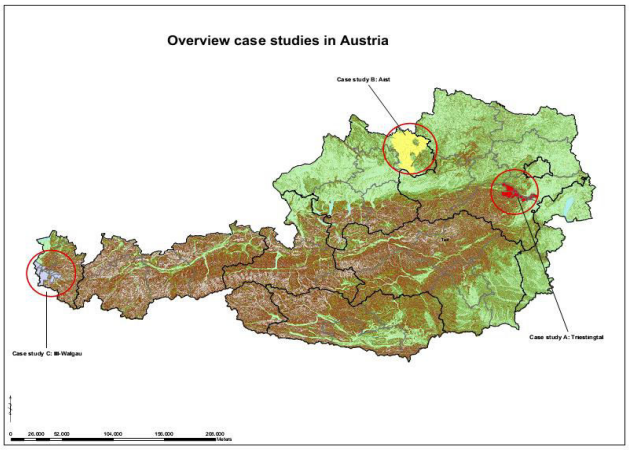

Figure 1. Overview of the selected case studies

4.1 Triesting-Region

The Triesting region shows a long tradition of structural flood defence measures. Analysing the catchment-management plan and local project appraisals, the Triesting-Tal follows two main strategies. A first step is the implementation of local flood defence schemes, mainly in the downstream – industrial communities. Although the regional authorities support this decision, this project blocked the implementation process goal of the catchment management plans in the past. The second step includes the implementation of flood storage in the upstream areas. In 2006, the project team updated the study resulting in the implementation of five flood storage areas with an average dam height of 5 to 8 m in the middle and upper part of the catchment, including the implementation of 2.5 km linear flood defence measures. This doubled the total project costs. However, the communities showed no or only minor interest in the implementation of this catchment management plan. Since 2009-10 the co-operation got a fresh boost. In March 2012 the Triesting-Tal inter-local co-operation realised its first flood storage project in the upstream catchment area. Next steps included the construction of a further flood storage near to the community Altenmarkt an der Triesting. Although this project was co-funded by the Triesting-Tal, the effect for the downstream communities is not given. This project was mainly done to encourage Altenmarkt an der Triesting to join the inter-local co-operation. Finally, the Triesting-Tal management plan has included semi-integrated flood risk management strategy. Nevertheless, the Triesting-Tal flood risk management strategy has no inter-local post-flooding measures.

4.2 Aist-Region

The Aist catchment, after the flood event of 2002, the national and regional authorities as well as local councillors started a draft management plan for the catchment. The strategy introduced a holistic view of the catchment with the key aspect to implement flood storage and ensure natural retention areas to reduce the flood peak. The first step includes the implementation of local flood defence measures. Here, the communities are responsible for the implementation. However, the inter-local co-operation is paying the required partnership funding. The second step includes the implementation of flood storage in the catchment. The study identified 25 potential flood storage areas with a total retention volume of ca. 7.5 million m³. This includes a reduction of the peak flow 350 m3s-1 to 240m3s-1. The total costs are estimated with 30 million Euros (4 Euros per m3 retention). However, the greatest benefits will impact the downstream community Schwertberg with a total reduction of the peak discharge of 109 m3s-1 [20]. The timeframe is designed for the next 30 years. Further measures refer to the implementation of forestry management concept. In 2002 flood event, a large number of debris jams was caused by spruces. Moreover,

the overall goal is to restore the forest close to the river banks by planting flood proofed trees.

4.3 Ill-Walgau-Region

The Ill-Walgau catchment shows a long tradition in the regulation of the river. The river development schemes include three key objectives. The first objective refers to the implementation of the WFD. The second objective is to increase the biodiversity within the catchment. The third objective refers to the implementation of flood storages in the catchment to reduce the flood peak in the catchment. The river development scheme includes the implementation of five flood storages in the catchment.

First, the key differences between the selected case studies refer to the number of communities and involved members. The study sites include between 12 to 27 members in the partnership approach. Moreover, most of the examples demonstrate linkages to non-state actors and stakeholders, such as small-business companies, utility companies or private householders. On the other side, the Aist and Triesting-Tal study sites show the challenge of non-members (free riders) within the inter-local co-operation process with the consequences that the non-members get the benefits from the co-operation without contributing (financially) to the costs. Second, key differences between the three study sites are the involvement of regional organisations in the inter-local co-operation. A third aspect refers to the initiation process. The Aist study sites, in contrast to the other three study sites, includes a strong bottom-up approach in the development of the inter-local co-operation. The main reason is the strong engagement of local grassroots organisations and policy makers in decision-making practices.

5 Results

5.1 Relationship and characterisation of integration

While examining the inter-local linkages in the region, we observed two key directions of local relationships in the three case studies.

First linkage is referred to the relationship between the regional and the local authorities. In Triesting-Tal, the characterisation of the integration between the different members in the inter-local co-operation can be described as, where, although formally in co-operation with each other, the extent to which local authorities co-operate with both regional authorities varies widely. This results in strong barriers in preventing local stakeholders from getting involved in the policy discussion [21, 22]. The regional authorities are the key leaders in the management process. They hold a monopoly in the planning of new flood defence measures as well as the initiation of new projects. In the Triesting-Tal co-operation, the national authority plays especially an important role in the overall process. Since the 2000s the WLV, as mentioned before, developed a regional study to get a more holistic view of the catchment. This catchment management plan foresees the implementation of inter-local flood defence measures, mainly flood storages in the upper part of the catchment. The regional authority plays a less important role, but the organisation is the official supervisor of the Triesting-Tal. In contrast, the Triesting-Tal shows a passive role in the implementation process. The consequences were a classical top-down flood risk management system, because the lack of local capacities [23], such as interest, resources or knowledge.

In the Aist catchment, the 2002 flood played an important role in the policy discussion at local levels. The local authorities, especially the downstream communities, enforced an overall flood risk management policy discussion in the catchment. Therefore, a key driver was the downstream community Schwertberg. Based on the Aist regional studies published in 2004, the regional authorities in co-operation with the downstream communities started to re-organise their inter-local co-operation. The catchment management plan foresees the implementation of inter-local flood defence measures, e.g. flood storages, forest management plan. The inter-local co-operation shows in contrast to the other two study sites a more active role in the planning and the strategic processes. Especially the steering group shows an active role in the overall implementation process. Moreover, they initiated individual strategies and planning concepts. However, in respect to the identification and integration of new members, a symmetrical relationship between the regional and local authorities is present. In the initiation phase, the regional authorities as well as some downstream communities have forced the communities to take part in the inter-local co-operation. Thus, an asymmetric relationship seems to be dominated by the monopoly position of the regional authorities in relation to technical knowledge and power.

The characterisation of the Ill-Walgau integration between local and regional authorities can be described as an asymmetric relationship between both organisations. The regional authority holds the monopoly position in the overall flood risk management policy. Since the mid-2000s, the regional authority has advanced a river development scheme for the river Ill. The management plan excludes the upper part of the catchment, which is in responsibility of the national authority. The consequences were that a multi-risk policy was not adopted, because of the exclusions of other mountain torrents, but in the same time simplification in the interacting between regional and local authorities, because of the exclusion of the national authority.

All interview partners stated that the regional authority were a key driver of the process. For this catchment management plan, the regional authorities have initiated the partnership approach in flood risk management in the region. The regional authority started the discussion with the local authorities to develop an inter-local co-operation (top-down approach). The regional authority has identified and integrated new members in the inter-local co-operation, because the regional authority negotiated with each individual actor

in the catchment with success. Consequently, this interaction and development enforced an asymmetrical relationship between regional and local actors. Further the asymmetrical relationship seems to be dominant in all flood risk management policy discussion.

Analysing the catchment management plan, the implementation process can be distinguished into two main stages. The first stage focuses on the implementation of flood defence schemes. The second stage focuses on maintenance of the schemes. The first phase is primarily dominated by the regional authority. Key tasks are the development and implementation of the catchment management plan. Moreover, the regional authority plays an important role in the negotiation process with farmers, which is different than in the other two study sites. The second phase includes a shift from the regional authority to the Ill-Walgau. The key tasks are the maintenance of the flood defence measures. Here the local authorities show overall quite a passive role. The results indicate a low willingness to request more tasks (responsibility and power) from the regional authorities. One reason for is that the local authorities expected that the regional authorities are to be responsible for defining and organising the flood risk management system with the consequence of transferring local responsibility to regional or national level [24, 25].

In sum, all three study sites show a highly asymmetric relationship between the national and regional authorities (national and regional authorities) and members of the inter-local co-operation. Jessop [26] referred mainly to two key aspects: (1) the society, especially different agents, acts interdependent from each other and (2) possibility of different linkages between different scales (vertical, horizontal, and diagonal). The regional authorities have the key role in the overall planning and strategic management process. In most of the cases, the inter-local co-operation plays a passive role in the current flood risk management discussion. Within this concentration of power towards the regional actors, the relationship is dominated by the monopoly position of the regional authorities based on technical knowledge and power [27].

5.2 Spatial and land use planning

The Triesting-Tal and Aist catchment areas are characterised by two main developments in spatial and land use development. The 'upper' part is predominated by a low dynamism in spatial activities, because of the minor social and economic activity with the result of socio-economic decline (shrinking) in the communities. This research recognises that under shrinking processes long-term developments, which include a fixed and continuous progression of socio-economic and demographic declines, which do not occur as temporary phenomena [28]. Their main problems are: rural depopulation, few enterprises, which cause socio-economic difficulties for the local authorities in terms of the lack of tax contributions and difficulties in maintain of existing infrastructure. The consequences were that local authorities find difficulties in the funding of flood alleviation schemes and future maintenance (which is also the responsibility of the local authority). The new flood alleviation schemes manifest in the upstream areas an overcapacity of infrastructures under a socio-economic and demographic decline. In particular, the upstream local authorities in Aist study site and to a lesser extent the Triesting-Tal municipalities in the upper part of the catchment show shrinking processes, where the population declines. Consequently, Moss [28] called these areas 'cold spots', where less valuable and interactive areas have a minor possibility of reducing flood alleviation schemes. On the other hand, commercially lucrative areas are benefiting from an improved system, such as downstream communities. The local authorities in the periphery need the inter-local co-operations to provide public services, such as schools, wastewater treatments or water supply systems. Nevertheless, most of the local authorities lack inter-local co-operations, because the fear of losing the qualification to exist [29]. Consequently, the policy promotes premium areas or spaces and marginal spaces or network ghettos on the other side [28, 30].

On the other hand, the communities from the lower part of the catchment have strong spatial and land use development. The region shows urban – rural disparities, especially between upstream and downstream communities. The downstream communities are affected by a strong drive to build new houses in community areas, mainly in floodplain areas. The community Leopersdorf in Triesting catchment area, for example, is planning to increase their population by approximately 20% in the next 10-15 years. In summary, the two regions show a downstream-upstream downgrade (uneven development) [31]. In the downstream area, the local spatial and land use management plans show a high competition between the different communities, especially regarding settlement of new businesses and families. In the Aist study site, for example, the downstream communities close to the economic centre around Linz, request lower tax rates, higher local financial grants, and economical specific building zones for residential and non-residential properties. Analysing the interviews, the institutional frameworks have not solved this problem, due to a lack of formal and informal rules and norms. On the basis of empirical results, the Federal States in Upper and Lower Austria provides no pressure to the local authorities to develop a catchment-wide spatial and land use management plans.

In the Ill-Walgau case study, for example, the regional authorities plan new instruments to restrict the land use in high risk areas. This planning instrument is based on an inter-local approach. Nevertheless, the upstream communities in Aist catchment and Ill-Walgau catchment have started an inter-local co-operation process relating to new business parks, because the benefits from the collaboration are higher than under a competitive approach (economics of scale). The overall goals have been to increase the attraction of the region for business investments. Furthermore, the co-operation should reduce

the inter-local competition between the communities in respect to new business settlements. This co-operation is indirectly affecting flood risk management. The new business-park is located in non-risk area and allows natural retention areas in the catchment for flood risk management purposes with the being a reduction of vulnerability in the catchment.

5.3 Emergency Management

In the case of Triesting-Tal, there is a high degree of harmonisation of emergency management plans, because the district developed an emergency management plan for the members of the Triesting-Tal. The main reason is that all communities are based in one political district. In contrast theAist case study is primarily based in two different political districts (Freistadt and Perg) in the Federal State Upper Austria. The political districts have developed a district-wide emergency management plan. In total the Aist case study has two different emergency management plans with a few cross-links between them. The main reason for this development is the legal framework in Austria. Austrian law does not demand a catchment-wide management plan in emergency management. Further the Federal State Upper Austria provides no general guidance documents to develop emergency management plans [32]. Similar results were observed in the Ill-Walgau case study. The River Ill is located in two political districts (Feldkirch and Bludenz), with two different emergency management plans. This includes spatial misfits between the emergency management plans and flood hazard [33]. Relationships between the two different management plans exist, but there are a lot of obstacles and gaps. The strategic proposal foresees to change these issues.

5.4 Public-private partnership

When looking at the relationship with non-communal actors, we observed a wide range of different situations among the case studies. First, the Triesting-Tal case study shows no partnership approach with non-communal actors, neither informally nor formally. Second, in the Aist case study we observe an informal partnership approach with the Regional Road Authority. The key objective is the financial contribution of the Regional Road Authority to the total project costs. The Regional Road Authority is less involved in the strategy planning process. Third, the Ill-Walgau case study, in contrast to the other two case studies, is various steps ahead. First, eight of the involved members are non-communal actors. Second, two of them are members of the steering group. Their involvement is not only based on financial support, but also in the strategic – development planning process. Moreover, the Ill-Walgau region has a long tradition of co-operation with private actors relating to flood risk management. Finally, the involvement of private actors increased the willingness of local authorities to participate.

As stated above non-communal actors play an important role in the Ill-Walgau. The Federal Water Engineering Administration was the key player in the negotiation process. They started the negotiation process with private actors. Moreover, the private actors play a more crucial role in the inter-local co-operation. In the steering group, two of the members are private actors. Both actors take part in the strategic planning process. The involvement of private actors in the co-operation process has encouraged other local authorities to take part in the inter-local co-operation. However, the interviews revealed that the negotiation process was longer and more complicated, because of the different interests. Throughout, past co-operation between the regional authorities, local authorities and private actors were given in the region. These experiences helped to identify and to encourage the private actors to take part in the inter-local co-operation. In summary, the private actors are well embedded in the co-operation.

5.5 Communication structure

The main actors in the communication process are the technocrats from the regional authorities (the national and the regional authorities). This has an impact also for the type of communication, which is critical to the relationship between local and regional actors. The interviews show strong conflicts and barriers as well as misunderstandings between local and regional actors. A core problem is that the local actors have difficulties in the understanding some of the technical language used. We noted clear misgivings from local actors towards regional-national actors because of the use of the expert language. Local actors do not have the knowledge, skills and understanding of the technical terminology, the concepts and ideas provided by the experts from regional or national offices. Therefore, the cases are characterized by a strong top-down communication approach.

These conflicts and barriers have a negative impact for the interaction with the local actors in flood risk management. In particular, this has been a clear hindrance in the empowerment of local actors in the ongoing policy discussion. Main barriers and conflicts were observed in the communication process between the two public authorities (the national and the regional authorities) with local authorities. The modes of conversations are mainly organised by few-to-few between regional authorities and selected members of the steering group (e.g. chairman and director). Nonetheless, a second important role is the communication process between the regional authorities and the steering groups (in general, based on regular meetings every 5-6 weeks). Overall, the communication process shows a broader dialogue, where both groups of actors exchange their idea, interests and concepts.

In the communication process, the main tools are technical models and assessments, which often are produced by private consultant groups. In particular, in the case studies Aist and Cockermouth the actors mainly used models and scientific reports for the internal communication process. This also shows the higher acceptance between both groups of actors. Nevertheless, the message is strongly expert-dominated. Local actors are disadvantaged, if they do not have the level of expertise and knowledge to understand it. A second problem refers to the transparency and external communication process. We identified an extreme position in the Triesting-Tal inter-local co-operation, where there was an untransparent approach. This links to the low interest of local politicians to communicate the planning process as well as the strong position of the regional technocrats.

Overall, the key contributions are the level of knowledge: skills and interest at local level in the risk communication process as well as the form of dialogue and use of language between the different actors. The communication process is more equally based, when local actors show a high degree of knowledge, like the case of Aist. In summary, we observed clear misgivings from the local actors towards the regional authorities, in particular when the different regional and national authorities use different approaches. Additionally, the results show a different level of information flow from the regional to the local authorities.

6 Conclusion

This research has explored the partnership approach in the flood risk management in Austria. The paper comprises an evolutionary approach to analyse the inter-local co-operation. The case studies shows a key barrier and challenge in relational proximity, which constrained the flood risk management policy discourse. The national and regional authorities shows different approaches and concepts for the flood risk management, for example the use of different return periods for the standard protection [34]. In summary, both organisations show strong interdependences. A third aspect relates to the initiation process, why the inter-local co-operation show a high interest in the overall strategy planning process as a successful factor in the implementation process [35]. Policy actors should try to encourage the co-operation to take over more responsibility as well as to close the gaps and barriers within the co-operation. The regional authorities may be challenged by the view of individual members. The aim is to encourage the inter-local co-operation to take over more tasks and responsibility to manage flood risk management, also due to a financial squeeze in the regional budgets. Moreover, the regional authorities should focus on further strengthening the co-operations.

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